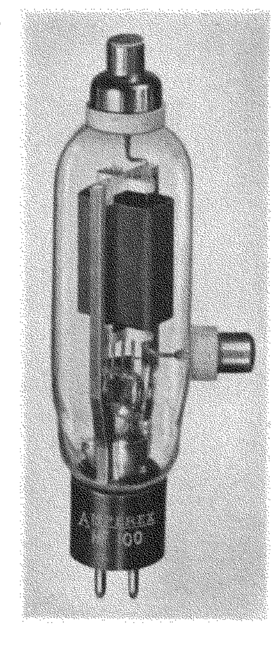
AMPEREX TRANSMITTING TUBE HF-100

An Ultra-High, Normal R.F. Power Amplifier and Oscillator and Class B Audio Amplifier or Modulator



The HF-100 is one of a distinctive group of low voltage high current tubes, an original development of the Amperex Engineering Laboratories. It is in addition characterized by an extraordinarily high ratio of transconductance to interelectrode capacitance, a characteristic which is responsible for its outstanding efficiency in ultra-high frequency circuits.

MAXIMUM RATINGS AND TYPICAL OPERATING CONDITIONS

Audio Frequency Power Amplifier or Modulator—Class B

	Maximum Rating per Tube	Typical Operation Two Tubes	
A.C. Filament Voltage	..	10	10
D.C. Plate Voltage	1750	1500	1750
D.C. Grid Voltage	..	—52	—62
Load Resistance (per tube) (ohms)	..	3000	4000
Effective Load Resistance (Plate to Plate) (ohms)	..	12000	16000
Zero-Signal Plate Current (ma.)	..	50	40
Peak A.F. Grid to Grid Voltage	..	264	324
Max. Signal Plate Current (ma.)	150	270	270
Max. Signal Plate Input (watts)	240	..	..
Plate Dissipation (watts)	75	..	..
Max. Signal Driving Power (Approx.) (watts)	..	2	9
Max. Signal Power Output (Approx.) (watts)	..	260	350

R.F. Power Amplifier—Class B—Telephony

(Carrier conditions for use with modulation factors up to 1.0)

	Maximum Rating per Tube	Typical Operation One Tube
A.C. Filament Voltage	..	10
D.C. Plate Voltage	1500	1500
D.C. Grid Voltage	..	—55
Peak R.F. Grid Voltage	..	80
D.C. Plate Current (ma.)	100	75
Plate Input (watts)	115	112
D.C. Grid Current (Approx.) (ma.)	..	1.5
Plate Dissipation (watts)	75	70
Grid Driving Power at Modulation Peak (Approx.) (watts)	..	3
Power Output (Approx.) (watts)	..	42

R.F. Power Amplifier—Class C—Telegraphy

	Maximum Rating per Tube	Typical Operation One Tube		
A.C.Filament Voltage	..	10	10	10
D.C. Plate Voltage	1500	1000	1250	1500
D.C. Grid Voltage	—300	—120	—200	—200
Peak R.F. Grid Voltage	..	250	330	340
D.C. Plate Current (ma.)	150	150	130	150
Plate Input (watts)	225	150	162	225
D.C. Grid Current (Approx.) (ma.)	30	21	18	18
Plate Dissipation (watts)	75	44	42	55
Driving Power (Approx.) (watts)	..	5	6	6
Power Output (Approx.) (watts)	..	106	120	170
Frequency Limit for Above Operation (mc.)	30	..	..	..

Plate Modulated R.F. Power Amplifier Class C

(Carrier conditions for use with modulation factor of 1.0)

	Maximum Rating per Tube	Typical Operation One Tube	
A.C. Filament Voltage	..	10.5	10.5
D.C. Plate Voltage	1250	1000	1250
D.C. Grid Voltage (Total)	—300	—200	—250
Fixed Bias (Approx.) Voltage	..	—30	—40
Grid Resistor (Approx.) (ohms)	..	8500	10000
Peak R.F. Grid Voltage	..	330	380
D.C. Plate Current (ma.)	120	120	110
Plate Input (watts)	140	120	137
D.C. Grid Current (Approx.) (ma.)	30	20	21
Plate Dissipation (watts)	50	30	32
Driving Power (Approx.) (watts)	..	6.5	8
Plate Power Output (Approx.) (watts)	..	90	105
Frequency Limit for Above Operation (mc.)	30	..	..
F.C.C. Broadcast Rating (watts) (Nearest Classification for Final Stage Use)	75	..	..

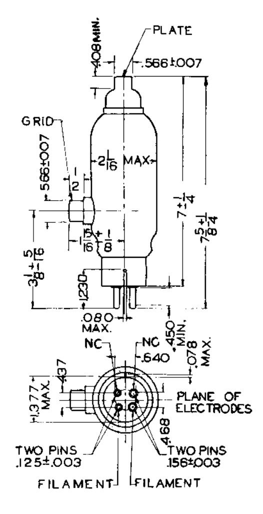
GENERAL CHARACTERISTICS

Filament:	
Voltage	10-10.5 volts
Current	2.5 amperes
Amplification Factor	23
Grid to Plate Transconductance at 100 ma.	4200
Direct Interelectrode Capacitances:	
Grid to Plate	4.5 $\mu\mu f$
Grid to Filament	3.5 $\mu\mu f$
Plate to Filament	1.4 $\mu\mu f$

Grid Modulated R.F. Power Amplifier—Class C

(Carrier conditions for use with modulation factor of 1.0)

	Maximum Rating per Tube	Typical Operation One Tube
A.C. Filament Voltage	..	10.0
D.C. Plate Voltage	1500	1500
D.C. Grid Voltage (Fixed Voltage Supply)	—300	—280
Peak R.F. Grid Voltage	..	340
D.C. Plate Current (ma.)	100	72
Plate Input (watts)	110	108
D.C. Grid Current (Approx.) (ma.)	..	1.5
Plate Dissipation (watts)	75	66
Grid Driving Power at Modulation Peak (Approx.) (watts)	..	6
Power Output (Approx.) (watts)	..	42
Frequency Limit for Above Operation (mc.)	30	..



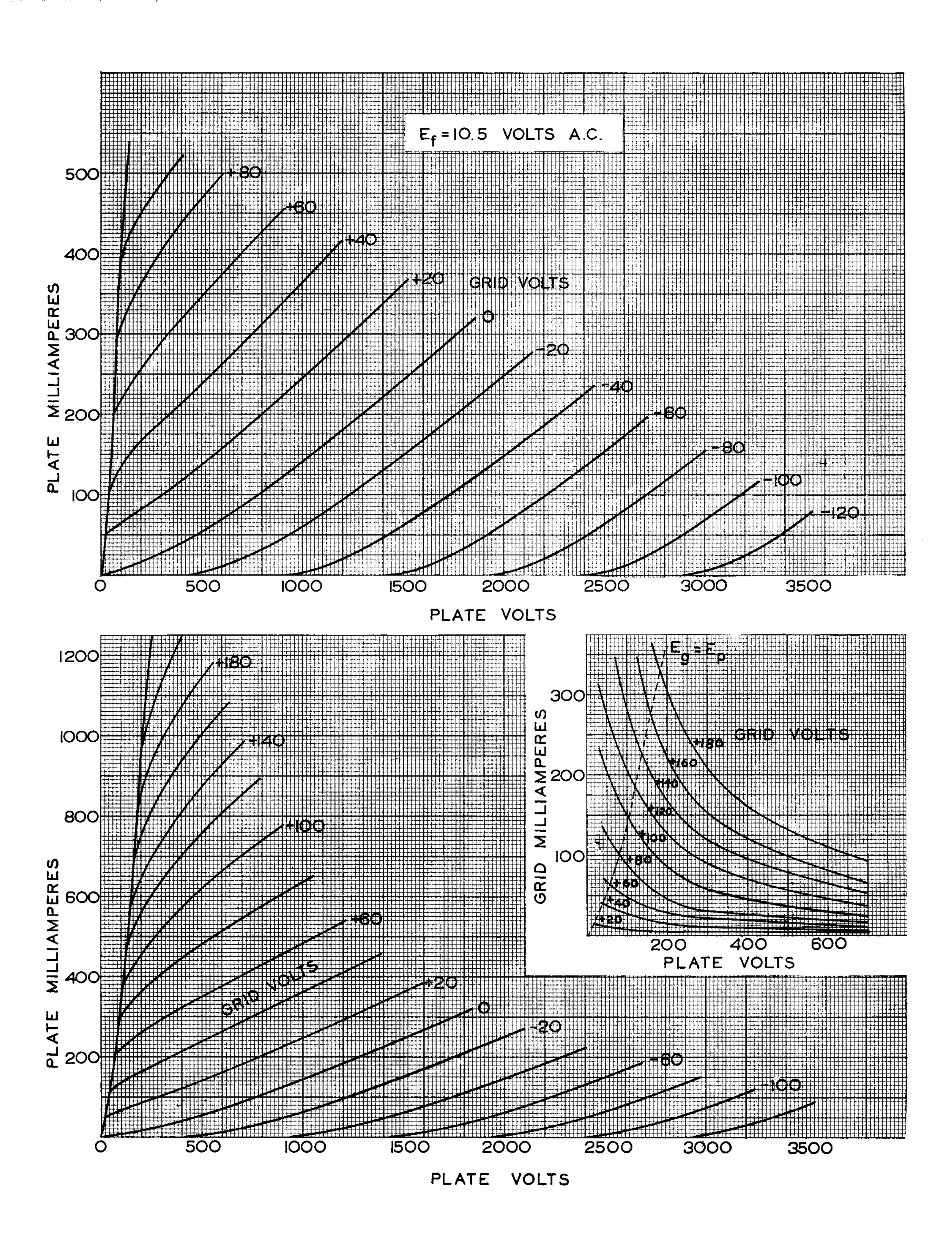
Self-Excited Ultra-High Frequency Oscillator or Power Amplifier—Class C

	Maximum Ratings for Operation at 30 mc.	60 mc.	90 mc.
D.C. Plate Voltage	1500	1200	1000
Modulated D.C. Plate Voltage	1250	1000	800
A.C. Plate Voltage	1500	1500	1200
D.C. Plate Current (ma.)	150	130	120
D.C. Grid Bias Voltage	—300	—225	—150
D.C. Grid Current (ma.)	30	30	20
Plate Dissipation (watts)	75	60	50

Typical High Frequency Performance of 2 Tubes in Tuned-Grid Tuned-Plate Push-Pull Circuits

Frequency	20 mc.	60 mc.	90 mc.
Plate Voltage	1500 A.C.	1200 D.C.	1000 D.C.
Plate Current	280 ma.	260 ma.	220 ma.
Power Delivered to Load Circuit	260 watts	220 watts	120 watts

AMPEREX
HF-100



E_f = 10.5 VOLTS A.C.
GRID VOLTS
+80
+60
+40
+20
0
-20
-40
-60
-80
-100
-120
PLATE MILLIAMPERES
PLATE VOLTS
+180
+140
+100
+60
+20
0
-20
-60
-100
GRID VOLTS
PLATE MILLIAMPERES
PLATE VOLTS
$E_g = E_p$
GRID VOLTS
+180
+160
+140
+120
+100
+80
+60
+40
+20
GRID MILLIAMPERES
PLATE VOLTS